

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2022/2023

DFN5114 – FUNDAMENTALS OF FINANCE 1

12 July 2023
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of NINE (9) printed pages with four (4) questions, list of formulae and 4 financial tables *excluding* the cover page.
2. Attempt ALL questions.
3. Please write all your answer in the **Answer Booklet** provided.
4. Marks are shown at the end of each question.

There are FOUR (4) questions in this section. Answer ALL.

Question 1 (25 marks)

- (a) You can deposit RM10,000 into an account paying 9% annual interest either today or exactly 10 years from today. How much better off will you be at the end of 40 years if you decide to make the initial deposit today rather than 10 years from today?

(10 marks)

- (b) Klang Valley had the heaviest rains in over decades. Millions of people were affected by the rainfall, roads were flooded, and the whole transport system had to be suspended for days. The government now is offering a flood recovery project that requires the tender to draw the flood waters out within a week. Bina Bhd is a large manufacturer of high-pressure industrial water pumps, and the firm decided to bid for the flood recovery project. The government will pay RM5 million this year and RM2 million for the following four years.

- (i) Draw the time line for the stream of cash flows.

(5 marks)

- (ii) If the discount rate is 8% per year, compute the present value of the project.

(5 marks)

- (iii) Suppose the project is expected to cost RM10 million today. Assess the acceptability of this project. (*i.e. Should Bina Bhd take the project if it is offered?*) Why or why not?

(5 marks)

Continued...

Question 2 (25 Marks)

- (a) Mr. Kumar has gathered data (as shown in Table 1 below) to find *the nominal rate of interest* for Security Alpha and Security Beta. Both securities are issued by different firms at the same point in time.

Table 1

Characteristics	Alpha	Beta
Inflation expectation premium	2%	3%
Risk Premium	3.5%	5%
Time to Maturity	5 years	10 years

- i. If the real rate of interest is currently 1.85%, find the *risk-free rate of interest* applicable to each security. (6 marks)
- ii. Compute the nominal rate of interest for each security. (6 marks)

- (b) Consider the following information:

Security	Time to maturity (years)	Inflationary expectation	Risk Premium
X	5	5.5%	5%
Y	6	5%	2%
Z	7	4.8%	3%

- (i) Suppose the rate of return on 3-month Treasury bills is 4%, and the 3-month expected inflation rate is 2%. Compute the real return. (3 marks)
- (ii) Based on your result in part (i), compute the nominal rate of return of security X, Y and Z. (*Please compute for each of the security*). (9 marks)
- (iii) Briefly illustrate why the inflationary expectation for each security is different. (1 mark)

Continued...

Question 3 (25 marks)

Madam Fatimah is considering investing in either of two outstanding bonds. The bonds both have RM1,000 par values and 11% coupon interest rates and pay annual interest. Bond A has exactly 5 years to maturity, and bond B has 15 years to maturity.

- (i) Compute the value of bond A if the required return is 8%.
(5 marks)
- (ii) Compute the value of bond A if the required return is 11%.
(5 marks)
- (iii) Compute the value of bond B if the required return is 8%.
(5 marks)
- (iv) Compute the value of bond B if the required return is 11%.
(5 marks)
- (v) From your findings from part (i) to (iv), briefly discuss the relationship between time to maturity and changing required returns.
(2 marks)
- (vi) If Fatimah wanted to minimize interest rate risk, which bond should she purchase? Please justify your answer.
(3 marks)

Continued...

Question 4 (25 marks)

- (a) In response to the recent stock market's reaction to its dividend policy, Teguh Industries has decided to increase its dividend payment at a rate of 5 percent per year. Last year, the firm paid dividend of RM3.15. The required rate of interest is 10 percent. Use the Gordon model to determine the maximum you would be willing to pay for a share of the stock.
(5 marks)
- (b) Wawasan Bhd. has been experiencing several years of financial difficulty and, thus, has considered maintaining its dividend payment at RM1.50 indefinitely. Compute the value of its common stock if the required rate of return is 8.5 percent.
(5 marks)
- (c) You are analyzing Canggih Bhd's stock which is a manufacturing company located in Shah Alam. The company just paid an annual dividend of RM5 a share and it is expected that the dividend will grow at 4% in the coming two years and then increase by 5% per year thereafter. Assume 12% required rate of return.
- (i) Use the two-stage discount model to compute the current value per share for Canggih Bhd.
(11 marks)
- (ii) If the share is currently selling at RM60, is the share overpriced/underpriced?
(2 marks)
- (iii) Based on your assessment in part (ii), would it be considered a good buy?
(2 marks)

End of Questions

DFN5114 List of Formulae

$$B_0 = \frac{I}{r} \left[1 - \frac{1}{(1+r)^n} \right] + \frac{M}{(1+r)^n}$$

$$CV = \frac{\text{Standard Deviation}}{\text{Expected Return}}$$

$$FV = PV \times (1+r)^n$$

$$FVA = PMT \times \left[\frac{(1+r)^n - 1}{r} \right]$$

Nominal rate = Real Rate + Inflation Rate + Risk Premium

$$P_0 = \frac{D_1}{r - g}$$

$$P_0 = \sum_{t=1}^N \frac{D_0 \times (1+g_1)^t}{(1+r_s)^t} + \left[\frac{1}{(1+r_s)^N} \times \frac{D_{N+1}}{r_s - g_2} \right]$$

$$PV = FV \times \frac{1}{(1+r)^n}$$

$$PVA = \frac{PMT}{r} \times \left[1 - \frac{1}{(1+r)^n} \right]$$

$$R_{Ft} = r^* + IP_t$$

$$\text{Standard Deviation } (\sigma) = \sqrt{\sum_{i=1}^n [R_i - E(R_i)]^2 / n}$$

Continued...

Financial Tables

Table A-1 Future Value Interest Factors for One Dollar Compounded at k Percent for n Periods: $FVIF_{k,n} = (1 + k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	1.0100	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500	1.1600	1.2000	1.2400	1.2500	1.3000
2	1.0201	1.0404	1.0609	1.0816	1.1025	1.1236	1.1449	1.1664	1.1881	1.2100	1.2321	1.2544	1.2769	1.2996	1.3225	1.3456	1.4400	1.5376	1.5625	1.6900
3	1.0303	1.0612	1.0927	1.1249	1.1576	1.1910	1.2250	1.2597	1.2950	1.3310	1.3676	1.4049	1.4429	1.4815	1.5209	1.5606	1.7280	1.9066	1.9531	2.1970
4	1.0406	1.0824	1.1255	1.1699	1.2155	1.2625	1.3108	1.3605	1.4116	1.4641	1.5181	1.5735	1.6305	1.6890	1.7490	1.8096	2.0736	2.3642	2.4414	2.8561
5	1.0510	1.1041	1.1593	1.2167	1.2763	1.3382	1.4026	1.4693	1.5386	1.6105	1.6851	1.7623	1.8424	1.9254	2.0114	2.1003	2.4883	2.9316	3.0518	3.7129
6	1.0615	1.1262	1.1941	1.2653	1.3401	1.4185	1.5007	1.5869	1.6771	1.7716	1.8704	1.9738	2.0820	2.1950	2.3131	2.4364	2.9860	3.6352	3.8147	4.8268
7	1.0721	1.1487	1.2299	1.3158	1.4071	1.5036	1.6058	1.7138	1.8280	1.9487	2.0762	2.2107	2.3526	2.5023	2.6600	2.8262	3.5832	4.5077	4.7684	6.2749
8	1.0829	1.1717	1.2688	1.3766	1.4875	1.6036	1.7259	1.8546	1.9906	2.1343	2.2868	2.4483	2.6199	2.8020	2.9959	3.2009	4.2998	5.5895	5.9605	8.1573
9	1.0937	1.1951	1.3048	1.4233	1.5513	1.6895	1.8385	1.9990	2.1719	2.3579	2.5580	2.7731	3.0040	3.2519	3.5179	3.8030	5.1598	6.9310	7.4506	10.604
10	1.1046	1.2190	1.3439	1.4802	1.6289	1.7908	1.9672	2.1599	2.3694	2.5977	2.8466	3.1183	3.4159	3.7407	4.0956	4.4814	6.1917	8.5944	9.3132	13.786
11	1.1157	1.2434	1.3842	1.5395	1.7103	1.8983	2.1049	2.3316	2.5804	2.8531	3.1518	3.4785	3.8359	4.2262	4.6524	5.1173	7.4301	10.657	11.642	17.922
12	1.1268	1.2682	1.4258	1.6010	1.7959	2.0122	2.2522	2.5182	2.8127	3.1384	3.4985	3.8960	4.3345	4.8179	5.3503	5.9360	8.9161	13.215	14.552	23.298
13	1.1381	1.2936	1.4685	1.6651	1.8855	2.1329	2.4098	2.7196	3.0658	3.4523	3.8833	4.3635	4.8980	5.4924	6.1528	6.8958	10.695	16.386	18.190	30.288
14	1.1495	1.3195	1.5126	1.7317	1.9799	2.2609	2.5785	2.9372	3.3417	3.7975	4.3104	4.8871	5.5348	6.2613	7.0757	7.9875	12.839	20.319	22.737	39.374
15	1.1610	1.3439	1.5580	1.8009	2.0789	2.3966	2.7590	3.1722	3.6425	4.1772	4.7846	5.4735	6.2543	7.1379	8.1371	9.2655	15.407	25.196	28.422	51.186
16	1.1726	1.3728	1.6047	1.8730	2.1829	2.5404	2.9522	3.4259	3.9703	4.5950	5.3109	6.1304	7.0673	8.1372	9.3576	10.748	18.488	31.243	35.527	66.542
17	1.1843	1.4002	1.6528	1.9479	2.2920	2.6928	3.1588	3.7000	4.3276	5.0545	5.8951	6.8660	7.9861	9.2765	10.761	12.468	22.186	38.741	44.409	86.504
18	1.1961	1.4282	1.7024	2.0258	2.4066	2.8543	3.3799	3.9980	4.7171	5.5598	6.5436	7.6900	9.0243	10.575	12.375	14.463	26.623	48.039	55.511	112.455
19	1.2081	1.4568	1.7535	2.1068	2.5270	3.0256	3.6165	4.3157	5.1417	6.1159	7.2633	8.6128	10.197	12.056	14.232	16.777	31.948	59.588	69.389	146.192
20	1.2202	1.4859	1.8061	2.1911	2.6533	3.2071	3.8697	4.6610	5.6044	6.7275	8.0623	9.6463	11.523	13.743	16.367	19.461	36.338	73.864	86.736	190.050
21	1.2324	1.5157	1.8603	2.2788	2.7860	3.3996	4.1406	5.0386	6.1088	7.4002	8.9492	10.804	13.021	15.668	18.822	22.574	46.005	91.592	108.420	247.065
22	1.2447	1.5460	1.9161	2.3699	2.9233	3.6035	4.4304	5.4365	6.6586	8.1403	9.9336	12.100	14.714	17.861	21.845	26.186	55.206	113.574	135.525	321.184
23	1.2572	1.5769	1.9736	2.4647	3.0715	3.8197	4.7405	5.8715	7.2579	8.9543	11.026	13.552	16.527	20.362	24.891	30.376	66.247	140.831	169.407	417.539
24	1.2697	1.6084	2.0328	2.5633	3.2251	4.0489	5.0724	6.3412	7.9111	9.8497	12.239	15.179	18.788	23.212	28.625	35.236	79.497	174.631	211.758	542.801
25	1.2824	1.6406	2.0938	2.6658	3.3864	4.2819	5.4274	6.8405	8.6231	10.835	13.585	17.000	21.231	26.462	32.919	40.874	95.396	216.542	264.638	705.641
30	1.3478	1.8114	2.4273	3.2434	4.3219	5.7455	7.6123	10.063	13.288	17.449	22.892	29.960	39.116	50.950	66.212	85.850	237.376	634.820	807.794	‘
35	1.4166	1.9999	2.8139	3.9461	5.5160	7.6861	10.677	14.785	20.314	28.102	38.575	52.800	72.069	98.100	133.176	180.314	590.668	‘	‘	‘
36	1.4308	2.0399	2.8983	4.1039	5.7918	8.1473	11.424	15.988	22.251	30.913	42.818	59.136	81.437	111.834	153.152	209.164	708.802	‘	‘	‘
40	1.4989	2.2680	3.2620	4.8010	7.0400	10.286	14.974	21.725	31.409	45.259	65.001	93.051	132.782	188.884	267.864	378.721	‘	‘	‘	‘
50	1.6446	2.6916	4.3839	7.1067	11.467	18.420	29.457	46.902	74.358	117.391	184.565	289.002	450.736	700.233	‘	‘	‘	‘	‘	‘

Continued...

Table A.2 Future Value Interest Factors for a One-Dollar Annuity Compounded at k Percent for n Periods: $FVIFA_{k,n} = [(1 + k)^n - 1] / k$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	1.0000	1.0200	1.0300	1.0400	1.0500	1.0600	1.0700	1.0800	1.0900	1.1000	1.1100	1.1200	1.1300	1.1400	1.1500	1.1600	1.1800	1.2400	1.2500	1.3000
2	2.0100	2.0400	2.0900	2.0800	2.0900	2.1000	2.1100	2.1200	2.1300	2.1400	2.1500	2.1600	2.1700	2.1800	2.1900	2.2000	2.2400	2.4000	2.5000	2.9000
3	3.0301	3.0604	3.0909	3.1216	3.1525	3.1836	3.2149	3.2464	3.2781	3.3100	3.3421	3.3744	3.4069	3.4396	3.4725	3.5056	3.6400	3.7776	3.9125	4.5000
4	4.0604	4.1216	4.1836	4.2465	4.3101	4.3746	4.4399	4.5061	4.5731	4.6410	4.7097	4.7793	4.8498	4.9211	4.9934	5.0665	5.3600	5.6842	5.7656	6.8700
5	5.1010	5.2040	5.3091	5.4163	5.5256	5.6371	5.7507	5.8666	5.9847	6.1051	6.2278	6.3528	6.4803	6.6101	6.7424	6.8771	7.4416	8.0484	8.2070	9.0431
6	6.1520	6.3081	6.4684	6.6330	6.8019	6.9753	7.1533	7.3359	7.5233	7.7156	7.9129	8.1152	8.3227	8.5355	8.7537	8.9775	9.9299	10.960	11.259	12.756
7	7.2135	7.4343	7.6625	7.8983	8.1420	8.3938	8.6540	8.9228	9.2004	9.4872	9.7833	10.089	10.405	10.730	11.067	11.414	12.916	14.615	15.073	17.583
8	8.2857	8.5820	8.8923	9.2142	9.5491	9.8975	10.260	10.637	11.028	11.436	11.859	12.300	12.757	13.233	13.727	14.240	16.499	19.123	19.842	23.858
9	9.3685	9.7546	10.159	10.583	11.027	11.491	11.978	12.488	13.021	13.579	14.164	14.776	15.416	16.085	16.786	17.519	20.799	24.712	25.802	32.015
10	10.462	10.950	11.464	12.006	12.578	13.181	13.816	14.487	15.193	15.937	16.722	17.549	18.420	19.337	20.304	21.321	25.959	31.643	33.253	42.619
11	11.567	12.169	12.808	13.486	14.207	14.972	15.784	16.645	17.560	18.531	19.561	20.655	21.814	23.045	24.349	25.733	32.150	40.238	42.566	56.405
12	12.683	13.412	14.192	15.026	15.917	16.870	17.888	18.977	20.141	21.384	22.713	24.133	25.650	27.271	29.002	30.850	39.581	50.895	54.208	74.327
13	13.809	14.680	15.618	16.627	17.713	18.882	20.141	21.495	22.953	24.523	26.212	28.029	29.985	32.089	34.352	36.786	48.437	64.110	69.760	97.625
14	14.947	15.974	17.086	18.292	19.599	21.015	22.550	24.215	26.019	27.975	30.095	32.393	34.883	37.581	40.505	43.672	59.196	80.496	86.849	127.913
15	16.097	17.293	18.599	20.024	21.579	23.276	25.129	27.152	29.361	31.772	34.405	37.280	40.417	43.842	47.580	51.660	72.035	100.815	109.687	167.286
16	17.258	18.639	20.137	21.825	23.657	25.673	27.888	30.324	33.003	35.950	39.190	42.753	46.672	50.980	55.717	60.925	87.442	126.011	138.109	218.472
17	18.430	20.012	21.762	23.698	25.840	28.213	30.840	33.750	36.974	40.545	44.501	48.884	53.739	59.118	65.075	71.673	105.931	157.253	173.636	285.014
18	19.615	21.412	23.414	25.645	28.192	30.906	33.999	37.450	41.301	45.599	50.396	55.750	61.725	68.394	75.836	84.141	128.117	195.394	218.045	371.518
19	20.811	22.841	25.117	27.671	30.539	33.760	37.379	41.446	46.018	51.159	56.939	63.440	70.749	78.969	88.212	98.603	154.740	244.033	273.556	483.973
20	22.019	24.297	26.870	29.778	33.066	36.766	40.995	45.762	51.160	57.275	64.203	72.052	80.947	91.025	102.444	115.380	186.698	303.601	342.945	630.165
21	23.239	25.783	28.676	31.969	35.719	39.993	44.855	50.423	56.765	64.002	72.265	81.698	92.470	104.768	118.810	134.841	225.026	377.465	429.681	820.215
22	24.472	27.298	30.537	34.248	38.505	43.392	49.006	55.457	62.873	71.403	81.214	92.503	105.491	120.436	137.632	157.415	271.031	469.056	538.101	1,000.000
23	25.716	28.845	32.453	36.618	41.430	46.996	53.436	60.893	69.532	79.543	91.148	104.603	120.205	138.297	159.276	183.601	326.237	582.630	673.626	1,300.000
24	26.973	30.422	34.426	38.083	44.502	50.816	58.177	66.765	76.790	88.497	102.174	118.155	136.831	158.659	184.168	213.978	392.484	723.461	843.033	1,600.000
25	28.243	32.030	36.459	41.646	47.727	54.865	63.249	73.108	84.701	98.347	114.413	133.334	155.620	181.871	212.793	249.214	471.981	898.092	1,000.000	1,900.000
30	34.765	40.568	47.575	56.085	66.439	79.058	94.461	113.283	136.308	164.494	199.021	241.333	293.199	356.787	434.745	530.312	1,000.000	1,900.000	2,000.000	3,000.000
35	41.680	49.994	60.462	73.652	90.320	111.435	138.237	172.317	215.711	271.024	341.590	431.663	546.681	693.573	881.170	1,111.111	1,900.000	3,000.000	3,100.000	4,000.000
36	43.077	51.994	63.276	77.598	95.836	119.121	148.912	187.102	236.125	299.127	380.164	484.463	618.749	791.673	1,000.000	1,250.000	1,900.000	3,000.000	3,200.000	4,100.000
40	48.886	60.402	75.401	95.026	120.800	154.762	198.635	253.057	337.882	442.593	581.826	767.091	1,000.000	1,250.000	1,500.000	1,750.000	1,900.000	3,000.000	3,300.000	4,200.000
50	64.463	84.579	112.797	152.667	209.348	290.336	406.529	573.770	815.084	1,111.111	1,500.000	2,000.000	2,600.000	3,300.000	4,200.000	5,300.000	5,300.000	8,000.000	8,000.000	10,000.000

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Table A.3 Present Value Interest Factors for One Dollar Discounted at k Percent for n Periods: $PVIF_{k,n} = 1 / (1 + k)^n$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9703	0.9615	0.9524	0.9432	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8696	0.8621	0.8333	0.8065	0.8000	0.7652
2	0.9803	0.9612	0.9426	0.9246	0.9070	0.8890	0.8734	0.8573	0.8417	0.8264	0.8116	0.7972	0.7831	0.7695	0.7561	0.7432	0.6941	0.6400	0.6400	0.5917
3	0.9706	0.9423	0.9151	0.8890	0.8638	0.8395	0.8163	0.7938	0.7722	0.7513	0.7312	0.7116	0.6931	0.6750	0.6578	0.6407	0.5787	0.5245	0.5120	0.4552
4	0.9610	0.9238	0.8885	0.8548	0.8227	0.7921	0.7629	0.7350	0.7084	0.6830	0.6587	0.6355	0.6133	0.5921	0.5718	0.5523	0.4823	0.4230	0.4096	0.3501
5	0.9515	0.9057	0.8626	0.8219	0.7835	0.7473	0.7130	0.6806	0.6499	0.6209	0.5935	0.5674	0.5428	0.5194	0.4972	0.4761	0.4019	0.3411	0.3277	0.2693
6	0.9420	0.8880	0.8375	0.7903	0.7462	0.7050	0.6663	0.6302	0.5963	0.5645	0.5348	0.5066	0.4803	0.4556	0.4323	0.4104	0.3349	0.2751	0.2621	0.2072
7	0.9327	0.8706	0.8131	0.7599	0.7107	0.6651	0.6227	0.5835	0.5470	0.5132	0.4817	0.4523	0.4251	0.3996	0.3759	0.3538	0.2791	0.2218	0.2097	0.1594
8	0.9235	0.8535	0.7894	0.7307	0.6768	0.6274	0.5820	0.5403	0.5019	0.4665	0.4339	0.4039	0.3762	0.3506	0.3269	0.3050	0.2266	0.1789	0.1678	0.1226
9	0.9143	0.8368	0.7664	0.7026	0.6446	0.5919	0.5439	0.5002	0.4604	0.4241	0.3909	0.3596	0.3329	0.3075	0.2843	0.2630	0.1938	0.1443	0.1342	0.0943
10	0.9053	0.8203	0.7441	0.6756	0.6139	0.5584	0.5063	0.4632	0.4224	0.3855	0.3522	0.3220	0.2948	0.2697	0.2472	0.2267	0.1615	0.1164	0.1074	0.0725
11	0.8963	0.8043	0.7224	0.6496	0.5847	0.5268	0.4731	0.4289	0.3875	0.3505	0.3173	0.2875	0.2607	0.2366	0.2149	0.1954	0.1346	0.0938	0.0859	0.0558
12	0.8874	0.7885	0.7014	0.6246	0.5568	0.4970	0.4420	0.3971	0.3555	0.3186	0.2858	0.2567	0.2307	0.2076	0.1869	0.1685	0.1122	0.0757	0.0687	0.0429
13	0.8787	0.7730	0.6810	0.6006	0.5303	0.4688	0.4159	0.3677	0.3262	0.2897	0.2575	0.2292	0.2042	0.1821	0.1625	0.1452	0.0935	0.0610	0.0550	0.0330
14	0.8700	0.7579	0.6611	0.5775	0.5051	0.4423	0.3878	0.3405	0.2992	0.2633	0.2320	0.2046	0.1807	0.1597	0.1413	0.1252	0.0779	0.0492	0.0440	0.0254
15	0.8613	0.7430	0.6419	0.5553	0.4810	0.4173	0.3624	0.3152	0.2745	0.2394	0.2090	0.1827	0.1589	0.1401	0.1229	0.1079	0.0648	0.0397	0.0352	0.0185
16	0.8528	0.7284	0.6232	0.5339	0.4581	0.3936	0.3387	0.2919	0.2519	0.2176	0.1883	0.1631	0.1415	0.1229	0.1069	0.0930	0.0541	0.0320	0.0281	0.0150
17	0.8444	0.7142	0.6050	0.5134	0.4363	0.3714	0.3166	0.2703	0.2311	0.1978	0.1696	0.1456	0.1252	0.1078	0.0929	0.0802	0.0451	0.0258	0.0225	0.0116
18	0.8360	0.7002	0.5874	0.4936	0.4155	0.3503	0.2959	0.2502	0.2120	0.1799	0.1528	0.1300	0.1108	0.0946	0.0808	0.0691	0.0376	0.0208	0.0180	0.0089
19	0.8277	0.6864	0.5703	0.4746	0.3957	0.3305	0.2765	0.2317	0.1945	0.1635	0.1377	0.1161	0.0981	0.0829	0.0703	0.0596	0.0313	0.0168	0.0144	0.0068
20	0.8195	0.6730	0.5537	0.4564	0.3769	0.3118	0.2584	0.2145	0.1784	0.1486	0.1240	0.1037	0.0868	0.0728	0.0611	0.0514	0.0261	0.0135	0.0115	0.0053
21	0.8114	0.6598	0.5375	0.4388	0.3589	0.2942	0.2415	0.1987	0.1637	0.1351	0.1117	0.0926	0.0768	0.0638	0.0531	0.0443	0.0217	0.0109	0.0092	0.0040
22	0.8034	0.6468	0.5219	0.4220	0.3418	0.2775	0.2257	0.1839	0.1502	0.1228	0.1007	0.0826	0.0680	0.0560	0.0462	0.0382	0.0181	0.0088	0.0074	0.0031
23	0.7954	0.6342	0.5067	0.4057	0.3256	0.2618	0.2109	0.1703	0.1378	0.1117	0.0907	0.0738	0.0601	0.0491	0.0402	0.0329	0.0151	0.0071	0.0059	0.0024
24	0.7876	0.6217	0.4919	0.3901	0.3101	0.2470	0.1971	0.1577	0.1264	0.1015	0.0817	0.0659	0.0532	0.0431	0.0348	0.0284	0.0126	0.0057	0.0047	0.0018
25	0.7798	0.6095	0.4776	0.3751	0.2953	0.2330	0.1842	0.1460	0.1160	0.0923	0.0736	0.0588	0.0471	0.0378	0.0304	0.0245	0.0105	0.0046	0.0038	0.0014
30	0.7419	0.5521	0.4120	0.3083	0.2314	0.1741	0.1314	0.0994	0.0754	0.0573	0.0437	0.0334	0.0256	0.0196	0.0151	0.0116	0.0042	0.0016	0.0012	*
35	0.7059	0.5000	0.3554	0.2534	0.1813	0.1301	0.0937	0.0676	0.0490	0.0356	0.0259	0.0189	0.0139	0.0102	0.0075	0.0055	0.0017	0.0005	*	*
40	0.6717	0.4529	0.3066	0.2093	0.1420	0.0972	0.0668	0.0460	0.0318	0.0221	0.0154	0.0107	0.0075	0.0053	0.0037	0.0026	0.0007	*	*	*
50	0.6080	0.3715	0.2281	0.1407	0.0872	0.0543	0.0339	0.0213	0.0134	0.0085	0.0054	0.0035	0.0022	0.0014	0.0009	0.0006	*	*	*	*

Continued...

Table A-4 Present Value Interest Factors for a One-Dollar Annuity Discounted at k Percent for n Periods: $PVIFA = [1 - 1/(1 + k)^n] / k$

Period	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%	11%	12%	13%	14%	15%	16%	20%	24%	25%	30%
1	0.9901	0.9804	0.9709	0.9615	0.9524	0.9434	0.9346	0.9259	0.9174	0.9091	0.9009	0.8929	0.8850	0.8772	0.8695	0.8621	0.8333	0.8065	0.8000	0.7692
2	1.9704	1.9416	1.9135	1.8861	1.8594	1.8334	1.8080	1.7833	1.7591	1.7355	1.7125	1.6901	1.6681	1.6467	1.6257	1.6052	1.5278	1.4563	1.4500	1.3609
3	2.8410	2.8039	2.7686	2.7351	2.7032	2.6730	2.6443	2.6171	2.5913	2.5669	2.5438	2.5218	2.5001	2.4788	2.4579	2.4374	2.3249	2.1981	2.1920	1.8161
4	3.6920	3.6477	3.6051	3.5641	3.5246	3.4865	3.4507	3.4171	3.3857	3.3564	3.3291	3.3037	3.2794	3.2562	3.2341	3.2132	2.9887	2.7043	2.6985	2.1662
5	4.5534	4.5013	4.4607	4.4214	4.3835	4.3470	4.3127	4.2805	4.2504	4.2224	4.1964	4.1722	4.1490	4.1268	4.1056	4.0855	3.8249	3.4843	3.4793	2.4356
6	5.3955	5.3354	5.2967	5.2594	5.2234	5.1885	5.1556	5.1246	5.0954	5.0681	5.0426	5.0189	4.9960	4.9740	4.9528	4.9325	4.6347	4.2443	4.2403	2.6427
7	6.2282	6.1600	6.1229	6.0870	6.0524	6.0191	5.9870	5.9561	5.9269	5.8994	5.8736	5.8494	5.8260	5.8034	5.7816	5.7607	5.4186	4.9743	4.9713	2.8021
8	7.0517	6.9755	6.9399	6.9051	6.8716	6.8393	6.8081	6.7780	6.7490	6.7218	6.6963	6.6724	6.6492	6.6267	6.6049	6.5839	6.1943	5.6943	5.6923	2.9247
9	7.8660	7.7817	7.7474	7.7138	7.6815	7.6503	7.6201	7.5910	7.5630	7.5368	7.5123	7.4894	7.4671	7.4455	7.4246	7.4044	6.9643	6.4143	6.4123	3.0190
10	8.6713	8.5792	8.5459	8.5131	8.4814	8.4507	8.4210	8.3923	8.3645	8.3385	8.3141	8.2912	8.2688	8.2470	8.2258	8.2052	7.7143	7.1143	7.1123	3.0915
11	9.4688	9.3697	9.3374	9.3055	9.2745	9.2445	9.2154	9.1872	9.1600	9.1346	9.1108	9.0884	9.0665	9.0451	9.0242	9.0038	8.4643	7.8143	7.8123	3.1473
12	10.2582	10.1520	10.1207	10.0894	10.0590	10.0295	10.0009	9.9732	9.9464	9.9214	9.8978	9.8754	9.8534	9.8318	9.8106	9.7898	9.1943	8.4843	8.4823	3.1903
13	11.0394	10.9259	10.8955	10.8649	10.8350	10.8059	10.7775	10.7500	10.7233	10.6984	10.6750	10.6529	10.6311	10.6096	10.5884	10.5676	9.9143	9.1543	9.1523	3.2233
14	11.8120	11.6913	11.6618	11.6319	11.6027	11.5742	11.5464	11.5193	11.4930	11.4684	11.4452	11.4224	11.4000	11.3780	11.3563	11.3350	10.6343	9.8243	9.8223	3.2487
15	12.5763	12.4484	12.4198	12.3907	12.3622	12.3344	12.3072	12.2806	12.2547	12.2295	12.2058	12.1834	12.1614	12.1397	12.1184	12.0975	11.3443	10.4843	10.4823	3.2692
16	13.3320	13.2000	13.1723	13.1441	13.1164	13.0892	13.0625	13.0363	13.0106	12.9864	12.9636	12.9412	12.9192	12.8975	12.8761	12.8550	12.0543	11.1443	11.1423	3.2832
17	14.0794	13.9432	13.9164	13.8891	13.8622	13.8358	13.8098	13.7843	13.7592	13.7346	13.7104	13.6866	13.6632	13.6401	13.6174	13.5950	12.7443	11.7843	11.7823	3.2948
18	14.8182	14.6778	14.6518	14.6253	14.5992	14.5735	14.5481	14.5230	14.4982	14.4738	14.4498	14.4261	14.4027	14.3796	14.3568	14.3343	13.4343	12.4243	12.4223	3.3037
19	15.5482	15.4036	15.3784	15.3527	15.3274	15.3024	15.2777	15.2533	15.2292	15.2054	15.1820	15.1589	15.1361	15.1136	15.0913	15.0692	14.1243	13.0543	13.0523	3.3105
20	16.2694	16.1206	16.0962	16.0713	16.0468	16.0226	16.0000	15.9777	15.9557	15.9340	15.9126	15.8914	15.8704	15.8496	15.8290	15.8086	14.8143	13.6843	13.6823	3.3158
21	16.9818	16.8290	16.8054	16.7813	16.7576	16.7342	16.7111	16.6882	16.6656	16.6432	16.6210	16.5990	16.5772	16.5556	16.5342	16.5130	15.4743	14.2943	14.2923	3.3198
22	17.6854	17.5285	17.5057	17.4814	17.4576	17.4341	17.4108	17.3877	17.3648	17.3421	17.3196	17.2973	17.2752	17.2533	17.2316	17.2101	16.1443	14.9143	14.9123	3.3230
23	18.3802	18.2192	18.1962	18.1718	18.1479	18.1242	18.1007	18.0774	18.0543	18.0314	18.0087	17.9862	17.9638	17.9415	17.9194	17.8974	16.8043	15.5543	15.5523	3.3254
24	19.0662	18.9011	18.8779	18.8534	18.8294	18.8056	18.7819	18.7584	18.7350	18.7118	18.6887	18.6658	18.6430	18.6204	18.5979	18.5755	17.4543	16.1643	16.1623	3.3272
25	19.7434	19.5742	19.5508	19.5262	19.5021	19.4782	19.4544	19.4308	19.4074	19.3841	19.3609	19.3378	19.3148	19.2919	19.2691	19.2464	18.1043	16.7643	16.7623	3.3285
30	23.8082	23.5296	23.4999	23.4691	23.4382	23.4074	23.3766	23.3458	23.3150	23.2843	23.2536	23.2230	23.1924	23.1618	23.1313	23.1008	21.7043	20.3043	20.3023	3.3321
35	28.4092	28.0196	28.0000	27.9691	27.9382	27.9074	27.8766	27.8458	27.8150	27.7843	27.7536	27.7230	27.6924	27.6618	27.6313	27.6008	25.9043	24.3043	24.3023	3.3330
40	33.8335	33.3439	33.3551	33.3142	33.2734	33.2326	33.1918	33.1510	33.1102	33.0694	33.0286	32.9878	32.9470	32.9062	32.8654	32.8246	31.0043	29.2043	29.2023	3.3332
50	39.1962	38.6066	38.6500	38.6091	38.5682	38.5274	38.4866	38.4458	38.4050	38.3642	38.3234	38.2826	38.2418	38.2010	38.1602	38.1194	35.8043	33.7043	33.7023	3.3333

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